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ABSTRACT

This document, eighth in a series of 11 subvolumes of a handbook prepared to provide training for educational research and development personnel in the development of instructional materials, deals with the task of planning accommodation of individual differences. The document is organized according to the two sequential steps involved in performing the task. Step 1, planning the use of accommodation techniques to be uniformly applied to all members of the target population, involves identifying administrative and instructional techniques. Step 2, planning the use of accommodation techniques to be applied uniformly to subpopulations or variably to ndividual students, involves identifying techniques to specifically accommodate subpopulations and individuals. Background information covers: (a) individual differences that need to be accommodated; (b) major ways to accommodate individual differences; (c) learner-selected vs. trainer-selected methods of accommodating individual differences; (d) accommodating a total population vs. subpopulations vs. individuals; and (e) differences in the ways accommodation occurs for a total population vs. subpopulations vs. individuals. (PD)

AIR-20241-9/71-RP

A Technology For Developing Instructional Materials

3 HANDBOOK

ED 092510

A. PLAN STUDY OF CRITERION BEHAVIORS

B. COLLECT AND ANALYZE DATA ABOUT CRITERION BEHAVIORS

C. SEQUENCE AND GROUP CRITERION BEHAVIORS

D. STATE CRITERION AND PREPARATORY OBJECTIVES

E. PLAN SIMULATION BASED ON INSTRUCTIONAL AND LOGISTICAL NEEDS

F. DEVELOP DIAGNOSTIC AND EVALUATIVE TESTS

G. FORMULATE INSTRUCTIONAL STRATEGIES

H. PLAN ACCOMMODATION OF INDIVIDUAL DIFFERENCES

I. DEVELOP INSTRUCTIONAL MATERIALS

J. EVALUATE INSTRUCTIONAL MATERIALS

X. INDEX

AUTHOR:

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VOLUMES IN THIS SERIES

1. USER'S MANUAL
2. ORIENTATION
3. HANDBOOK
   (eleven sub-volumes)
4. WORKBOOK
5. FINAL EXERCISES

FOREWORD

This is one of a series of eleven HANDBOOK sub-volumes which has been prepared to provide training for educational R&D personnel in the development of instructional materials.

The USER'S MANUAL, which accompanies the series, describes the role each volume is designed to play and the sequence recommended for its use in the training process. The user is, therefore, urged to read the instructions in the USER'S MANUAL before using this or any other separate volume.

ACKNOWLEDGMENTS

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U.S.O.E. sponsorship does not in any way imply official endorsement of the views expressed in this volume.

The author is indebted: to Dr. Robert Fitzpatrick for reviewing portions of the series of volumes and for informal discussions concerning several training issues; to Mrs. Zita Glasgow for the first and critical use of this volume; and, not least, to Miss Kathleen Gubala for her tireless preparation of the complex manuscript required by this HANDBOOK.

George L. Gropper
March 1973

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H.

IDENTIFICATION MATRIX

	CRITERIA FOR IDENTIFYING TYPES OF INDIVIDUAL DIFFERENCES IT IS DESIRABLE TO ACCOMMODATE		
TYPES OF INDIVIDUAL DIFFERENCES	ENTERING BEHAVIOR	ABILITIES	INTERESTS
CRITERIA	-*Before beginning instruction, the learner may already have in his repertoire:* ••*The criterion behavior in varying degrees, from zero to anywhere up to 100%* ••*An incorrect version of the criterion behavior* ••*Other related criterion behaviors* ••*Other unrelated criterion behaviors, potentially interfering with the learning of the criterion behavior*	-*General intelligence* -*Specific abilities or disabilities relevant to:* ••*The criterion behavior to be learned* ••*Preparatory behaviors selected to provide a suitable learning progression*	-*Interests, attitudes, goals, etc., which can make the instructional materials or procedures:* ••*Reinforcing* ••*Non-reinforcing* ••*Aversive*
IMPLICATIONS	-Possession of these entering behaviors may require or profit from: ••The student bypassing some or all of the instructional sequence ••The student receiving remedial instruction	-Possession of abilities (or not possessing them) may require: ••Specialized instruction differing from that received by some or by all other students	-Possession or not possessing interest in criterion behavior and associated instructional materials may require: ••The possession of special extrinsic reinforcers to reinforce persistence at work

H. IDENTIFICATION MATRIX	MAJOR METHODS TO ACCOMMODATE INDIVIDUAL DIFFERENCES		
METHODS	INSTRUCTIONAL	ADMINISTRATIVE	EVALUATIVE
CRITERIA	-*Control of learning rate* ••*Allowing learner to select own pace* ••*Setting an appropriate pace for the learner* -*Selection of preparatory practice progressions appropriate to individual differences to be accommodated* -*Selection of intrinsically reinforcing materials*	-*Assignment of instructional materials to be covered:* ••*Bypassing materials* ••*Assignment of remedial materials* ••*Assignment of review or refresher materials* -*Student self-selection of objectives to be covered* -*Delivery of extrinsic reinforcers* -*Tryout of materials with target population*	-*Change in standards of acceptable performance*

EXAMPLES	SEE SUBSEQUENT SECTIONS

H.

IDENTIFICATION MATRIX

	WHO DETERMINES HOW INSTRUCTION WILL BE VARIED	
SOURCE OF DECISION	STUDENT DETERMINED	INSTRUCTOR/TRAINER DETERMINED
CRITERIA	-*Self-selected learning pace* -*Self-selection of objectives to be covered* -*Self-selection of sequence of covering objectives*	-*Instructor-selected learning pace* ••*Speeding some students up* ••*Slowing some students down* -*Instructor selection of objectives to be covered* -*Instructor selection of sequence of covering objectives*

EXAMPLES	SEE SUBSEQUENT SECTIONS

H.

IDENTIFICATION MATRIX

	AMOUNT OF VARIATION CREATED IN ORDER TO ACCOMMODATE INDIVIDUAL DIFFERENCES		
WHO IS ACCOMMODATED	Steps taken to accommodate the TOTAL POPULATION	Steps taken to accommodate the SUB-POPULATIONS	Steps taken to accommodate EACH INDIVIDUAL
CRITERIA	-*The individual student is accommodated by selection and development of methods appropriate to:* ••*The average student in the total population* *OR* ••*The least able student in the total population* -*A fixed number of alternative methods are selected to accommodate everyone in the total target population*	-*The individual student is accommodated by selection and development of methods appropriate to:* ••*The needs, abilities, or interests of sub-populations within the total population:* *e.g., high and low IQ groups* *e.g., tracks based on prior achievement* -*A fixed number of alternative methods are selected to accommodate everyone in a sub-population*	-*The individual student is accommodated by selection and development of methods appropriate to:* ••*Each student* -*Individuals are able to make free selections*
EXAMPLES	-*Selecting and trying out progressions with a sample of the population* ••*Making learning easy enough for the average student in the total target audience* -*Selecting a broad enough sample of reinforcers which is appropriate to the whole population*	-*Selecting and trying out progressions with a sample of the sub-population* ••*Making learning easy enough for the average student in the total target audience* -*Selecting a broad enough sample of reinforcers which is appropriate to the whole sub-population*	-*Allowing student to:* ••*Bypass what he knows* ••*Adopt his own pace* ••*Select his own objectives* -*Allowing student to select his own extrinsic reinforcers*

H.

IDENTIFICATION MATRIX

	CRITERIA FOR IDENTIFYING DIFFERENCES IN THE WAY A TOTAL POPULATION, SUB-POPULATIONS, AND INDIVIDUALS ARE ACCOMMODATED		
WHO IS ACCOMMODATED	Steps taken to accommodate the TOTAL POPULATION	Steps taken to accommodate the SUB-POPULATIONS	Steps taken to accommodate EACH INDIVIDUAL
CRITERIA	-*Decisions are made by trainer/instructor regarding:* ••*Objectives* ••*Instructional sequences covering them* ••*Standards* -*A single instructional sequence or task is developed which is designed to be relevant to all students in the TOTAL population* -*Availability of administrative options (bypassing, review, remedial) is determined by trainers and criteria for assignment to them are determined by them also* -*Trainers decide whether instruction will be self-paced or fixed-paced*	-*Decisions are made by trainer/instructor regarding:* ••*Objectives* ••*Instructional sequences covering them* ••*Standards* -*Two or more instructional sequences or tasks are developed which are designed to be relevant to all the students in two or more SUB-POPULATIONS* -*Assignment to different tracks is based on criteria determined by the trainer/instructor* -*Trainers decide whether instruction will be self-paced or fixed-paced*	-*Decisions are made by the individual student regarding:* ••*Objectives* ••*Instructional sequences covering them* ••*Standards* -*The student decides:* ••*What objectives he will cover* ••*What type of instruction he will use (from those available in Columns 1 and 2 or from elsewhere)* ••*How he will use what is available (in Columns 1 and 2)*

STEP H.1

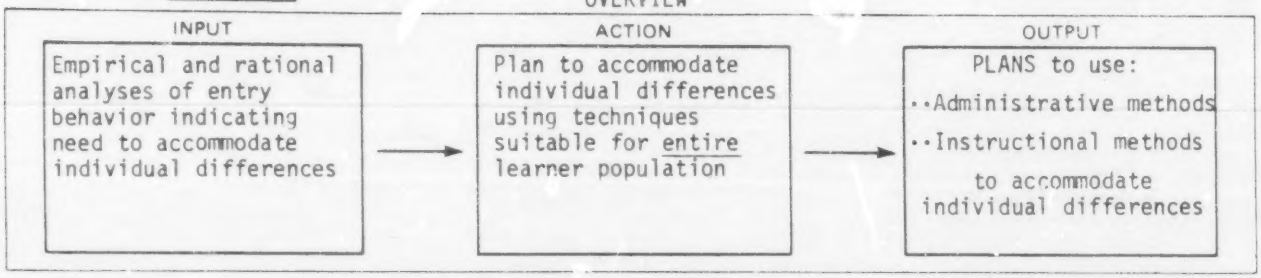
H.1 Plan the use of accommodation techniques to be uniformly applied to all members of the target population.

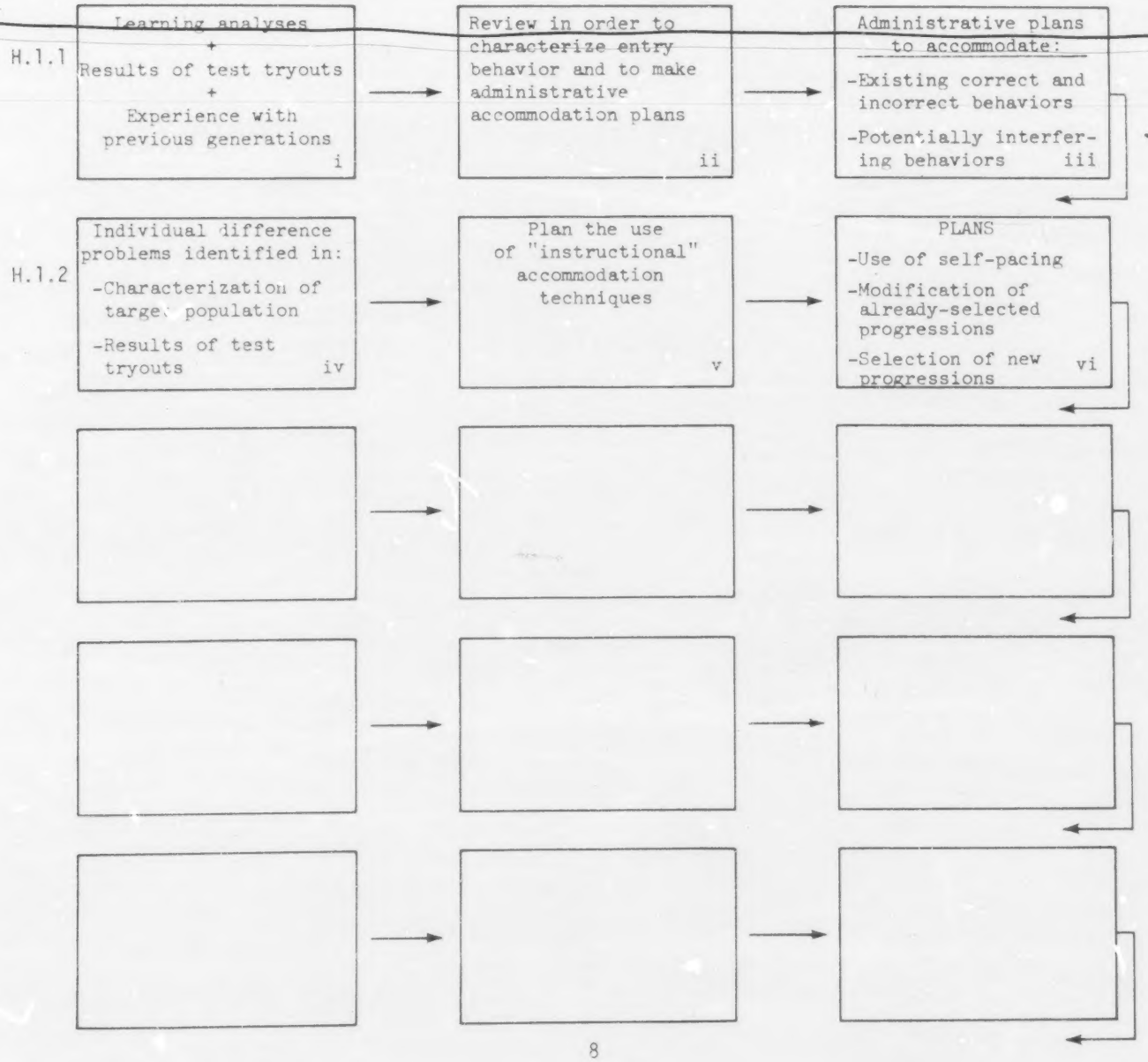
H.1.1 Identify administrative techniques to be used.

H.1.2 Identify instructional techniques to be used.

STEP H.1

OVERVIEW


INPUT
ACTION
OUTPUT
Empirical and rational analyses of entry behavior indicating need to accommodate individual differences
Plan to accommodate individual differences using techniques suitable for entire learner population
PLANS to use:
··Administrative methods
··Instructional methods
to accommodate individual differences



STEP H.1

PAGE INDEX

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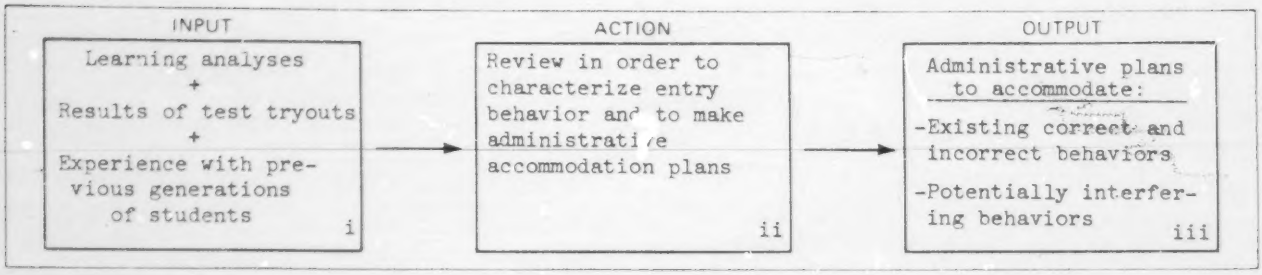
PREVIEW OF THE NEXT SubSTEP

YOUR PRODUCT	*Decisions whether or not to use administrative procedures to accommodate individual differences:* *... bypass methods* *... review or refresher methods* *... remedial methods*
WHAT YOU WILL WORK FROM	(1) Learning analyses (2) Results of tests administered as a pretest identifying what is already in learners' repertoires (3) Experience with previous generations of students
WHAT YOU WILL DO	(1) Identify problems requiring accommodations (2) Select appropriate administrative approaches to the accommodation of individual differences
FORMS YOU WILL USE	None

DESCRIPTION OF STEP	H.1.1



Job Aid Contents

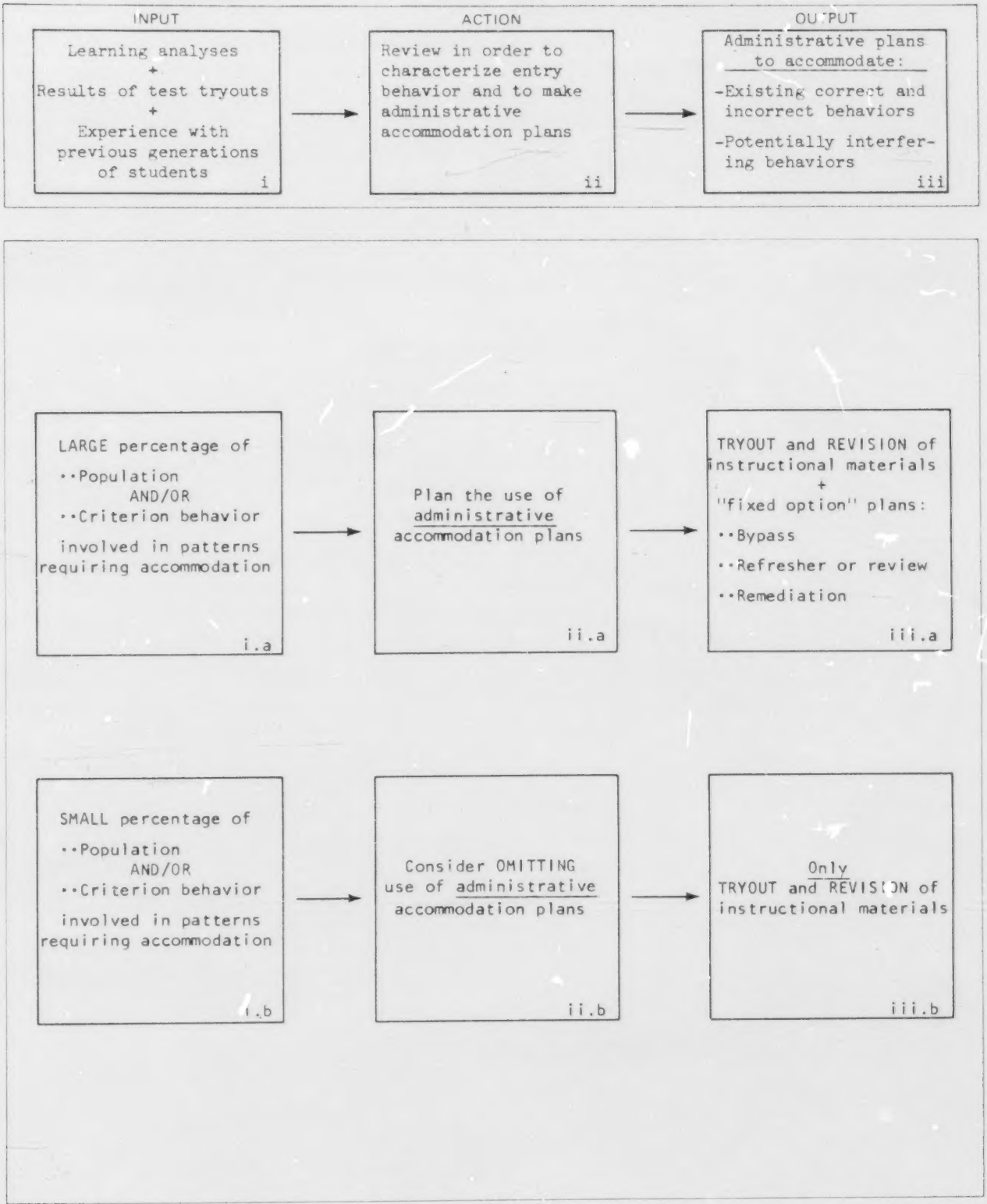
CRITERIA FOR IDENTIFYING INPUTS	ACTION TO BE TAKEN	STANDARD FOR OUTPUTS	FORMS TO USE
-MATRIX: Types of administrative accommodation techniques . . 13-16 -MATRIX: Information to review . . . 18	-MATRIX: When to consider "fixed option" accommodation plans 19	-MATRIX: Identification of administrative methods 21	SUMMARY OF PROCEDURES 20

Required Materials

COMPLETED MATERIALS	STEP	COMPLETED FORMS	STEP	BLANK FORMS
Test results	F.4	Learning analysis on FORM A.5(4) or (11) (carried forward from)	G.4.2	
		Summary of analysis on FORM G.1(1) (carried forward from)	G.4.2	

Sub-STEP H.1.1

JOB DIAGRAM



BACKGROUND INFORMATION

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Conditions calling for alternative administrative accommodation methods	15
Advantages of using "fixed option" accommodation methods	16

H.1.1
IDENTIFICATION
MATRIX

ADMINISTRATIVE ACCOMMODATION TECHNIQUES
APPLICABLE TO THE TOTAL TARGET POPULATION

ADMINISTRATIVE METHODS	Selection from among a FIXED number of OPTIONS	A SINGLE approach to the total population
CRITERIA	-*Any student can bypass one or more of a fixed number of instructional sequences covering a criterion behavior* -*Any student can be assigned to one or more of a fixed number of remedial sequences* ··*Before instruction begins* ··*During instruction* -*Any student can be assigned to one or more of a fixed number of review or refresher sequences* ··*Before instruction begins* ··*During instruction*	-*Tryout of instructional materials with a sample of the target population and revision of materials based on the collective experience of the sample. Degree of revision results in EITHER of the following:* ··*The average student is accommodated* ··*The least able student is accommodated*
OUTCOME	-The individual student is accommodated to varying degrees depending on: ··The extent to which the number of fixed options provide a variable enough response to meet individual needs	-The individual student is accommodated to varying degrees depending on: ··Which of the above standards is set; and/or ··How closely he resembles the sample used in the tryout

H.1.1

IDENTIFICATION MATRIX

	CRITERIA FOR IDENTIFYING CONDITIONS UNDER WHICH ADMINISTRATIVE ACCOMMODATION TECHNIQUES SHOULD BE PLANNED	
ADMINISTRATIVE METHODS	SELECTION FROM FIXED OPTIONS ••Bypassing ••Remediation ••Review/refresher	TRYOUT AND REVISION OF INSTRUCTIONAL MATERIALS
CRITERIA	*-When PRE-test data indicate:* *••Mastery of part or all of criterion behavior at entry* *••Learner has in his repertoire behavior offering potential interference with acquisition of criterion behavior:* *Competing behavior* *Error behavior* *-When performance on instructional materials indicate:* *••Errors*	*-This approach is ALWAYS to be used*

H.1.1

IDENTIFICATION MATRIX

ADVANTAGES OFFERED BY USE OF "FIXED OPTION" ACCOMMODATION TECHNIQUES	
EFFECTIVENESS of instruction	EFFICIENCY of instruction
-Allowing a student to bypass what he already has mastered, OR *-Allowing a student merely to review what he has previously learned (and has partially forgotten):* *··Can prevent student boredom (an aversive experience)* *-Providing remedial training or instruction for potentially competing behaviors or for existing errors can:* *··Forestall new errors* *··Forestall perpetuation of errors* *-Providing remedial sequences for errors committed during instruction (rather than the mere reliance on feedback can prevent:* *··Perpetuation of errors committed*	*-Either the assignment of students only to what they need to learn (and allowing them to bypass what they already know)* *-Or the assignment of students only to review or refresher material results in:* *··Reduction in training/ instructional time* *··Reduction in training/ instructional cost*

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H.1.1

IDENTIFICATION MATRIX

INFORMATION TO REVIEW WHEN CONSIDERING THE USE OF "FIXED OPTION" ACCOMMODATION PLANS

TYPES OF INFORMATION TO REVIEW	EMPIRICAL DATA	RATIONAL ANALYSES
CRITERIA	-*Evidence about entry behavior of the target population obtainable from:* ••*Results of tryout of tests held with samples of the target population* ••*Results from previous but comparable generations of students* -*Evidence to be reviewed concerns whether or not the population has in its repertoire:* ••*Some percentage of the criterion behavior* ••*Behaviors incompatible with the criterion behavior to be learned (e.g., existing associations)* ••*An incorrect version of the criterion behavior (i.e., errors)*	-*Evidence about the difficulty of acquiring the skills involved in the criterion behavior obtainable from:* ••*Separate learning analysis for each sub-STEP in the criterion recorded on a FORM A.5(4) or (11)* ••*A summary of both learning and performance difficulties for all the sub-STEPS recorded on FORM G.1(1)*
USE OF INFORMATION (See page 19)	-Identification of one or more of the following: ••Instructional sequences which can be bypassed ••The need for review or refresher materials (rather than a full-blown instructional sequence) ••The need for remedial instructional sequences to eliminate existing errors (misconceptions) ••The need for special sequences to prevent likely interference due to existing behaviors	-Identification of potential learning difficulties which can benefit from: ••Remedial sequences to be built into instruction at error-prone points as a means of presenting perpetuation of errors

H.1.1

IDENTIFICATION MATRIX

TYPES OF CONDITIONS WHICH ARE IDENTIFIED IN THE REVIEW OF INFORMATION RELEVANT TO CONSIDERATION OF "FIXED OPTION" ACCOMMODATION OF INDIVIDUAL DIFFERENCES

TYPES OF CONDITIONS	Estimated percentage of POPULATION exhibiting a pattern	Percentage of SUB-STEPS in criterion behavior involved in pattern
CRITERIA	-*The percentage of the population exhibiting:* ••*An entry behavior pattern* ••*Anticipated performance pattern during instruction*	-*The percentage of sub-STEPS (i.e., the number of sub-STEPS/ total number of sub-STEPS) in the criterion behavior which:* ••*Are involved in the pattern of entry pattern* ••*Are likely to be involved in the performance pattern during instruction*
EXAMPLE	-*The percentage of students who have in their repertoire: (a) all or part of the criterion behavior; or (b) incorrect version of the criterion behavior; or (c) potentially competing behaviors can range from:* ••*Zero percent* *to* ••*100 percent*	-*The percentage of sub-STEPS which: (a) are in student's entry repertoire; or (b) are incorrectly learned; or (c) might interfere with learning the criterion behavior can range from:* ••*Zero percent* *to* ••*100 percent*

H.1.1

IDENTIFICATION MATRIX

DETERMINING WHEN TO CONSIDER THE USE OF "FIXED OPTION" ACCOMMODATION TECHNIQUES

CONDITIONS	The percentage of the POPULATION AND/OR the percentage of SUB-STEPS involved in pattern is LARGE	The percentage of the POPULATION AND/OR the percentage of SUB-STEPS involved in pattern is SMALL
ACTION TO TAKE	For criterion behavior already in student's repertoire -*Plan the option of bypassing instructional material covering those portions already in student's repertoire* -*Plan a review or refresher option* For errors in student's repertoire or for potentially competing behaviors -*Plan remedial options for known or anticipated problem areas*	For criterion behavior already in student's repertoire -*Consider omitting a bypass option* -*Consider writing a review or refresher option* For errors in student's repertoire or for potentially competing behaviors -*Consider omitting remedial options*
EXAMPLES	e.g., -*Fifty percent of the population is estimated to have the criterion behavior in their repertoire* -*A bypass option would reduce training time for this large group* e.g., -*There are many difficult learning problems and anticipated errors involved in most of the sub-STEPS of a criterion behavior* -*An investment of time and money in preparing remedial (e.g., branching) sequences would be repaid by the production of the likely perpetuation of errors throughout the entire instructional sequence without some form of remedial instruction*	e.g., -*Ten percent of the population could merely with review or refresher materials be brought up to a required standard* -*Creation of the review of refresher sequence may be too costly for so small a group* e.g., -*There are few difficult learning problems and anticipated errors involved in some of the sub-STEPS of a criterion behavior* -*An investment of time and money in preparing remedial (e.g., branching) sequences would NOT be repaid by the production of the likely perpetuation of errors throughout the entire instructional sequence without some form of remedial instruction*

H.1.1

ILLUSTRATION SUMMARIZING PROCEDURES INVOLVED IN PLANNING THE USE OF ADMINISTRATIVE ACCOMMODATION TECHNIQUES

#1

PLAN TO TRY OUT INSTRUCTIONAL MATERIALS WITH SAMPLE OF LEARNER POPULATION AND MAKE REVISIONS BASED ON RESULTS

SEE TASK J

#2

REVIEW

a. Results of learning analysis on complete set of FORMS A.5(4) or (11) associated with criterion behavior

b. Summary of learning and performance problems on FORM G.1(1)

#3

a. Identify needs for "fixed option" accommodation of individual differences

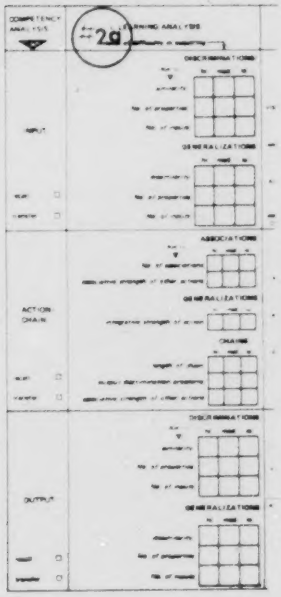
b. Plan to use or not to use:

··Bypass methods

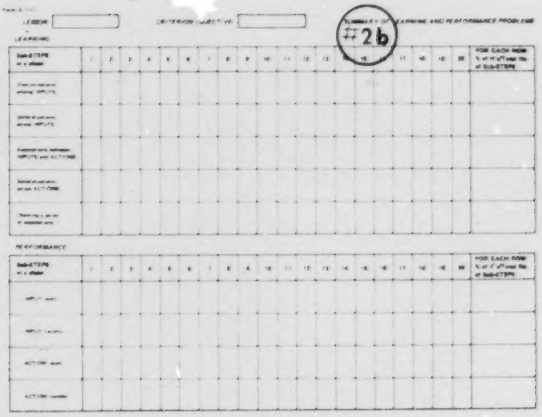
Review or refresher methods

Remedial methods

LEARNING ANALYSIS portion of FORM A.5(4)



FORM G.1(1)



H.1.1

STANDARDS MATRIX

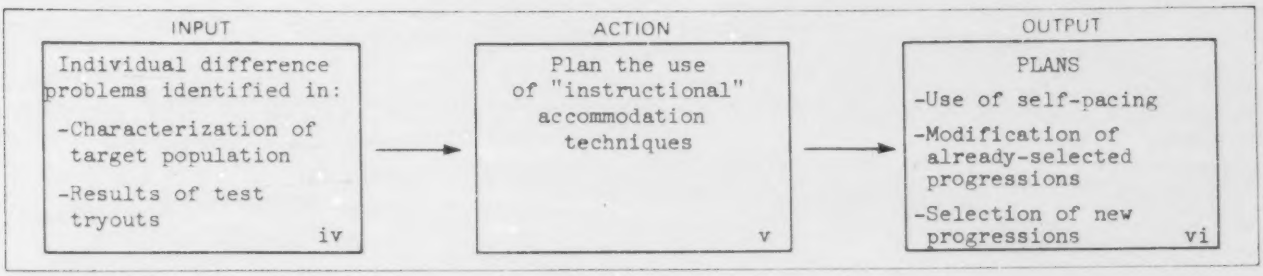
CRITERIA FOR ASSESSING THE ADEQUACY OF PLANNING FOR ADMINISTRATIVE ACCOMMODATION OF INDIVIDUAL DIFFERENCES

PROPERTIES	COMPLETENESS	RELEVANCE
CRITERIA	*PLANS INCLUDE:* *-Decision to try out and revise instructional materials* *-Consideration of "fixed options" available to accommodate individual differences:* *••Bypass* *••Review or refresher materials* *••Remedial materials*	*PLANS ARE BASED ON IDENTIFIED NEEDS:* *-High percentage of learner population* *AND/OR* *-High percentage of sub-STEPS in criterion behavior* *••Associated with entry behavior:* */Degree of criterion behavior in learner's repertoire* */Errors previously learned* */Potentially competing behaviors* *••Associated with likely errors during instruction*

PREVIEW OF THE NEXT SubSTEP

YOUR PRODUCT	*Plans for the use of instructional approaches to the accommodation of individual differences:* *... self-pacing* *... modification of previously selected preparatory progressions* *... selection of new progressions*
WHAT YOU WILL WORK FROM	(1) Characterization of the target audience (2) Results of tests administered as a pre-test characterizing learners' existing pre-training repertoire and problems.
WHAT YOU WILL DO	(1) Identify characteristics of the target audience (general ability problems, special ability problems, existing repertoire, etc.) which create accommodation problems. (2) Select instructional accommodations methods: ... self pacing ... modification already selected or selection of new preparatory progressions.
FORMS YOU WILL USE	None

DESCRIPTION OF Sub-STEP	H.1.2



Job Aid Contents

CRITERIA FOR IDENTIFYING INPUTS	ACTION TO BE TAKEN	STANDARD FOR OUTPUTS	FORMS TO USE
-MATRIX: Instructional techniques for accommodating individual differences . .27-31 -MATRIX: Information to review 34	-MATRIX: When to use instructional techniques to accommodate individual differences . . 35	-MATRIX: Adequacy of "instructional" accommodation plans 37	SUMMARY OF PROCEDURES . . . 36

Required Materials

COMPLETED MATERIALS	STEP	COMPLETED FORMS	STEP	BLANK FORMS
Characterization of target audience	A.1.2	Test tryout results (carried forward from)	H.1.1	

Sub-STEP H.1.2

JOB DIAGRAM

INPUT	ACTION	OUTPUT
Individual difference problems identified in: -Characterization of target population -Results of test tryouts iv	Plan the use of "instructional" accommodation techniques v	PLANS -Use of self-pacing -Modification of already-selected progressions -Selection of new progressions vi

In TASK "G"

Fixed-pace media (films, TV, audio tape) have not been selected iv.a	Plan the use of self-pacing v.a	Plans calling for each student to adopt his own learning pace vi.a
Preparatory progressions relevant to population problems already selected iv.b	Plan modification of progressions to make learning easier v.b	MODIFICATION PLANS -Amount of practice -Type of practice -Amount or type of assistance vi.b
Preparatory progressions relevant to population problems not already selected iv.c	Plan selection of progressions relevant to problems v.c	Plans to select progressions relevant to: ··Abilities ··Entry behavior status vi.c

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How progressions can be modified to meet accommodation needs	30, 31

H.1.2

IDENTIFICATION MATRIX

TYPES OF INSTRUCTIONAL OPERATIONS WHICH CAN BE APPLIED TO THE TOTAL LEARNER POPULATION AS A MEANS OF ACCOMMODATING INDIVIDUAL DIFFERENCES IN ABILITY

OPERATIONS	Control of LEARNING PACE	Selection or development of SPECIAL preparatory practice progression (not already selected in TASK G)	Modification of preparatory practice progression (selected in TASK G)
CRITERIA	-*Each student in the learner population is allowed to:* ••*Adopt the pace at which he works through an instructional sequence*	-*Instructor/trainer selects progressions geared to problems anticipated with the particular learner population:* ••*Visual examples (c) OR Concrete examples (d) for populations with lower verbal skills or reading problems* ••*Learning procedures before learning to deal with issues/ concepts about the procedures (e)* ••*Practice of errors before criterion practice (l): for learner populations requiring remediation*	-*Instructor/trainer alters the progression already selected to make it easier:* ••*Provides more assistance during practice* ••*Creates a progression requiring more or different practice before reaching criterion practice*
EXAMPLES		e.g., physics concepts and principles -*Provides visual demonstrations of or visual examples of concepts and principles before requiring the student to deal with them abstractly*	e.g., physics concepts and principles -*Original plans called for a recognition/ production progression. To this is added as an intermediate step "editing" practice.* -*Original plans called for a prompting/fading sequence. Fading of cues is delayed; i.e., more practice items may have cues or clues before cues are withdrawn OR the cues used may provide more assistance*

H.1.2

DECISION MATRIX

	TYPES OF PROGRESSIONS (NOT ALREADY SELECTED) TO CONSIDER IN ORDER TO MEET SPECIFIC NEEDS		
TYPES OF NEEDS	1 To accommodate those with low GENERAL aptitude	2 To accommodate those with low SPECIFIC aptitudes	3 To accommodate those with ERROR patterns in their repertoire (concerning criterion behavior)
ACTION TO TAKE	*CONSIDER* *(b) R/E/P* *(i) Diagramming* *(o) Repetition* *(p) Review* *(q) Varied examples*	*CONSIDER (in addition to those Column #1)* *-For low VERBAL aptitudes:* *(c) Visual/verbal* *(d) Concrete/abstract* *(e) Procedures/ principles* *(f) Examples or demonstrations* *(h) Visual cues* *(i) Diagramming* *-For low QUANTITATIVE aptitudes:* *(f) Examples or demonstrations* *(g) Verbal cues* *(i) Diagramming* *(n) Backward chaining*	*CONSIDER* *(l) Errors/criterion* *(m) Editing/criterion*

H.1.2
IDENTIFICATION
MATRIX

WAYS IN WHICH FIVE MAJOR TYPES OF PROGRESSIONS
CAN BE MODIFIED TO ACCOMMODATE INDIVIDUAL DIFFERENCES
(ON THIS PAGE AND ON OPPOSITE PAGE)

TYPES OF PROGRESSIONS	1 Modification of progressions involving UNIT SIZE	2 Modification of progressions involving MODE	3 Modification of progressions involving PROMPTING/FADING*
CRITERIA	*(a) Shaping* *••The shaping process can begin with a smaller chunk of the criterion behavior to be practiced initially; AND/OR* *••Increments in the size of the chunk (upon successful mastery of the prior chunk) can be made more gradually*	*These progressions can be modified:* *For: (b) R/E/P:* *••Including all elements R+E+P where initially only one or two were planned on* *••Increasing the number of practice problems in each of the three modes* *(c) Visual/verbal* *For: (d) Concrete/abstract* *(e) Procedures/principles* *••Increasing the number of practice items in each of the various modes*	*These progressions can be modified:* *For: (f) Examples/demonstrations* *(g) Verbal cues* *(h) Visual cues* *(i) Diagramming, overviews* *••Developing stronger prompts (i.e., provide more assistance in identifying answers) AND/OR* *••Providing prompts for a longer period or for more practice items before beginning to withdraw them*

*Also applicable when combined with other types of progressions

EXAMPLES	e.g., -The criterion behavior consists of 27 sub-STEPS -The original plan was (with assistance) to get students to practice the first three sub-STEPS in one chunk -The modified plan calls for having students attempt to practice only one sub-STEP initially	e.g., -Original practice progression called for: 5 recognition, 2 editing, and 5 production practice items -The modified progression calls for 8 recognition, 5 editing, and 10 production practice items	e.g., -Original practice called for availability of diagrams through the first 15 practice items and its non-availability through the remaining 5 -The modified plan calls for keeping the diagram available during the first 20 items and adding 5 items with no diagram

H.1.2

IDENTIFICATION MATRIX

WAYS IN WHICH FIVE MAJOR TYPES OF PROGRESSIONS CAN BE MODIFIED TO ACCOMMODATE INDIVIDUAL DIFFERENCES (ON THIS PAGE AND ON OPPOSITE PAGE)

TYPES OF PROGRESSION	4 Modification of progressions involving CONTENT	5 Modification of progressions involving FREQUENCY OR VARIATION
CRITERIA	*For: (n): Backward chaining* *••The size of each unit to be practiced (starting with the last, next to the last, and so forth) can be made smaller* *••The amount of practice for each unit can be increased* *••The use of other progressions in combination can be introduced; e.g., cues or R/E/P* *For: (j): Principles/procedures* *(k): Altered criterion/criterion* *(l): Errors/criterion* *(m): Editing/criterion* *••The amount of practice for each unit can be increased* *••The use of other progressions in combination can be introduced; e.g., cues or R/E/P*	*For: (o): Repetition* *(p): Review* *(q): Varied examples* *••The amount of each can be increased* *••Other progressions can be added; e.g., cues or R/E/P*
EXAMPLES	e.g., -*The original plan called for the practice of the last sub-STEP in a chain, to be followed by the next to the last, and so on back* -*A modified plan could call for practice of just part of the last sub-STEP before all of the sub-STEP is practiced*	e.g., -*The original plan called for just one (identical) repetition of a practice problem* -*A revised plan might call for two or more repetitions*

JOB PROCEDURES

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Determining when to consider particular "instructional" accommodation methods	35
SUMMARY OF PROCEDURES	36
Adequacy of planning of use of instructional methods to accommodate individual differences	37

H.1.2

IDENTIFICATION MATRIX

	SOURCES OF INFORMATION TO REVIEW IN ORDER TO IDENTIFY ACCOMMODATION NEEDS	
SOURCES OF INFORMATION	CHARACTERIZATION OF TARGET AUDIENCE	RESULTS OF TRYOUT OF TESTS
CRITERIA	*From TASK A:* *OUTPUT of Sub-STEP A.1.2* *-Identification of attributes of the target learner population:* *··General or special abilities* *··Past achievement levels*	*From TASK F:* *OUTPUT of Sub-STEP F.4.2* *-Identification of attributes of the target learner population:* *··What students can and cannot do (regarding the criterion behavior)* *··What students now do which is wrong (regarding the criterion behavior)* *··What students now do which might interfere with learning the criterion behavior*

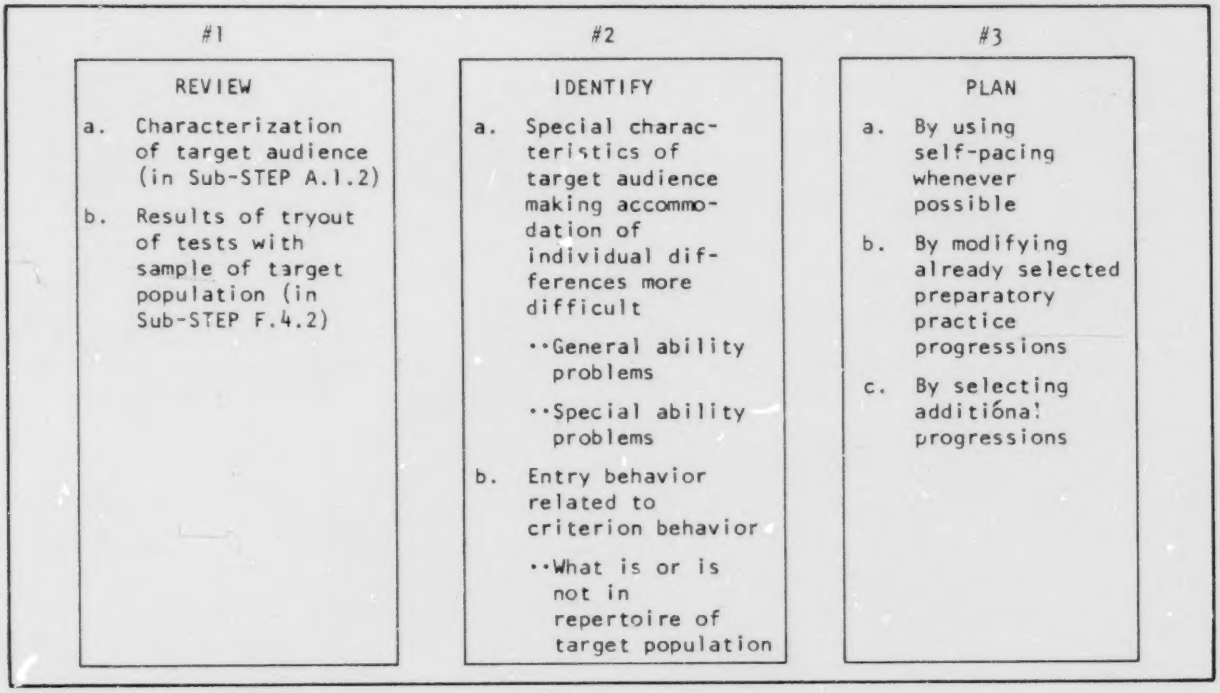
H.1.2

DECISION MATRIX

DETERMINING WHEN TO CONSIDER "INSTRUCTIONAL" METHODS OF ACCOMMODATING THE TARGET POPULATION

INPUT CONDITIONS	Strategies developed in TASK G do NOT call for the use of fixed-pace media (such as film, TV, tape)	Preparatory practice PROGRESSIONS which are particularly relevant to problems of target population HAVE ALREADY BEEN SELECTED IN TASK G	Preparatory practice PROGRESSIONS which are particularly relevant to problems of target population HAVE NOT BEEN SELECTED IN TASK G
ACTION TO TAKE	*-Plan to allow each student to adopt his own pace*	*-Modify the progressions as a means of making it possible for all the students in the population to perform in relatively error-free fashion:* *··Provide more assistance than originally planned* *··Add to amount of practice originally planned* *··Add another form of practice* *··Alter the size of unit to be practiced*	*-Select the progressions which are relevant and add to strategy plans formulated in TASK G*

H.1.2 ILLUSTRATION SUMMARIZING PROCEDURES INVOLVED IN PLANNING THE ACCOMMODATION OF THE TARGET POPULATION WITH "INSTRUCTIONAL" METHODS


#1
REVIEW
a. Characterization of target audience (in Sub-STEP A.1.2)
b. Results of tryout of tests with sample of target population (in Sub-STEP F.4.2)
#2
IDENTIFY
a. Special characteristics of target audience making accommodation of individual differences more difficult
··General ability problems
··Special ability problems
b. Entry behavior related to criterion behavior
··What is or is not in repertoire of target population
#3
PLAN
a. By using self-pacing whenever possible
b. By modifying already selected preparatory practice progressions
c. By selecting additional progressions

H.1.2

STANDARDS MATRIX

CRITERIA FOR ASSESSING THE ADEQUACY OF PLANS FOR ACCOMMODATING THE TARGET POPULATION WITH "INSTRUCTIONAL" TECHNIQUES

OUTPUT PROPERTIES	RELEVANCE	COMPLETENESS
CRITERIA	-*Plans are based on and are responsive to systematic identification of accommodation needs:* ··*In TASK A - The characterization of the target population* ··*In TASK F - The identification of problems related to the criterion behavior (based on results of test tryouts)* -*Accommodation plans are geared to the types of problems identified:* ··*Ability problems* ··*Problems relating to entry behavior pertinent to the criterion behavior*	-*All individual difference needs are identified and considered* -*All techniques for meeting these needs are considered:* ··*Self-pacing* ··*Modification of already-selected progressions* ··*Selection of new progressions*

STEP H.1

COMPLETION CHECKLIST

	IDENTIFIED	PERFORMED	PRODUCED	FORMS COMPLETED
H.1.1	Administrative accommodation techniques to be used for total population			
H.1.2	Instructional accommodation techniques to be used for total population			

STEP H.2

H.2 Plan the use of accommodation techniques to be applied uniformly to sub-populations or variably to individual students.*

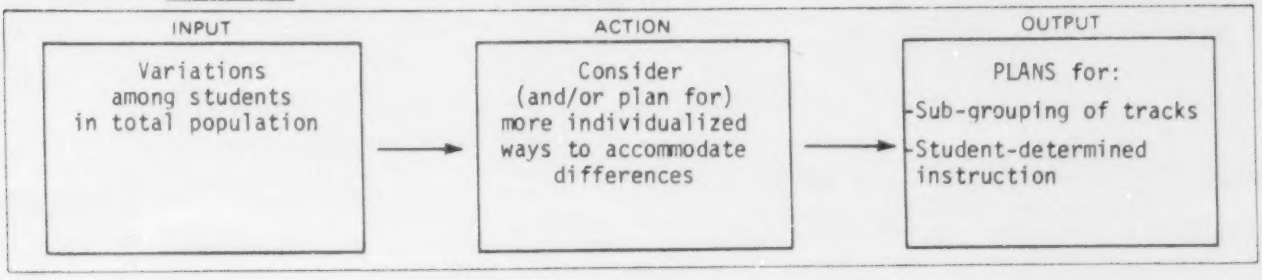
H.2.1 Identify techniques to be used to accommodate sub-populations.

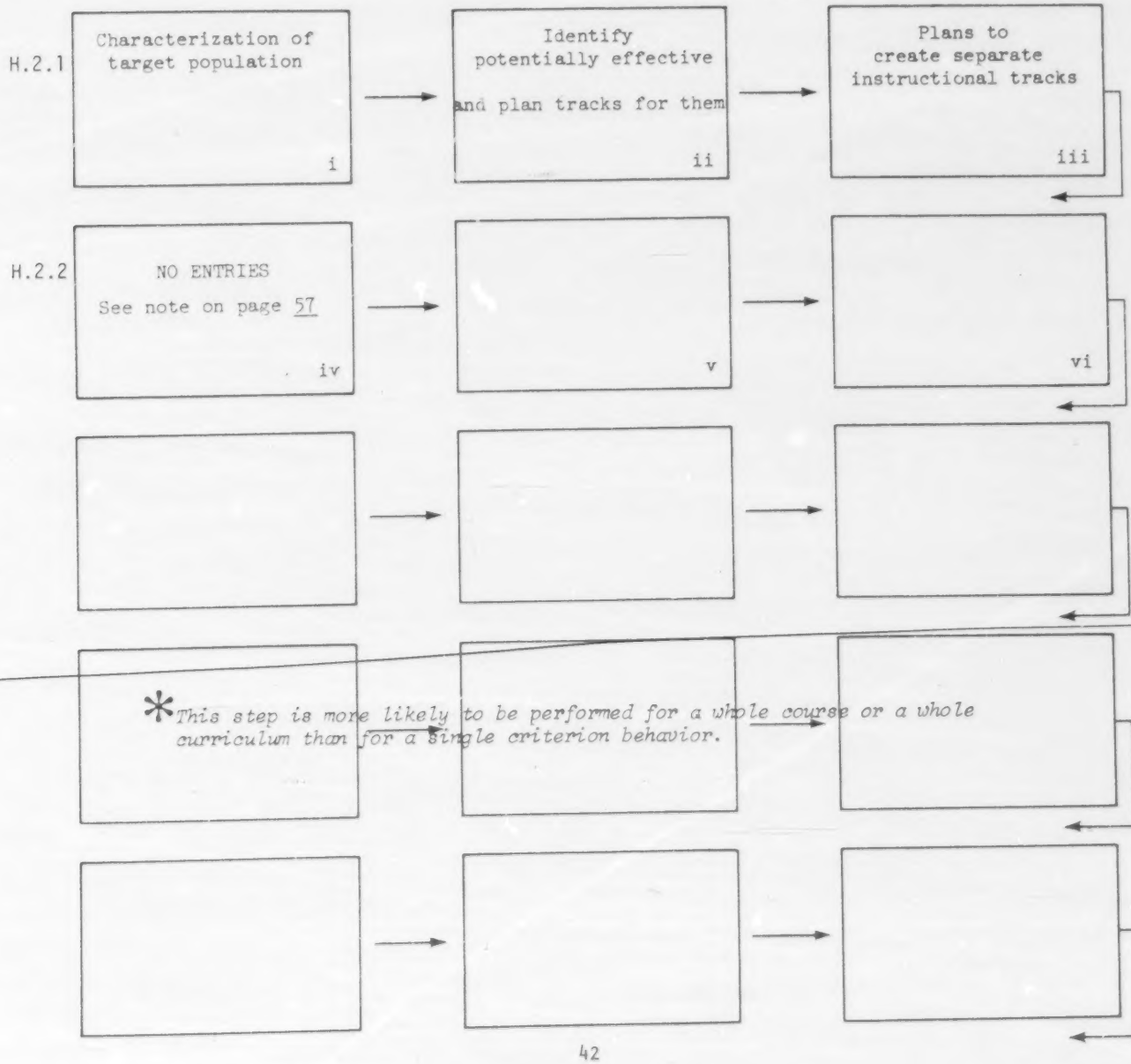
H.2.2 Identify techniques to be used that are specific to individuals.

*This step is more likely to be performed for a whole course or a whole curriculum than for a single criterion behavior.

STEP H.2 *

OVERVIEW





This step is more likely to be performed for a whole course or a whole curriculum than for a single criterion behavior.

STEP H.2

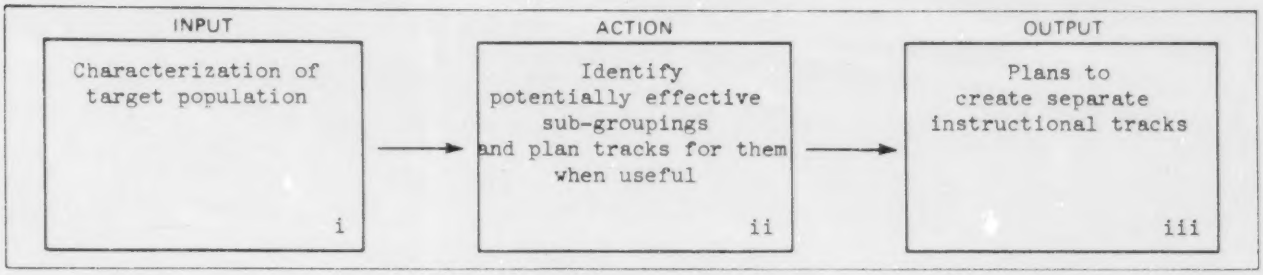
PAGE INDEX

	CRITERIA FOR IDENTIFYING INPUTS	ACTION TO BE TAKEN	STANDARD FOR OUTPUTS	FORMS TO USE
H.2.1	-MATRIX: Conditions favoring use of tracks . . . 48	-MATRIX: Types of tracks to consider 49	-MATRIX: Adequacy of plans for creating separate tracks 53	SUMMARY OF PROCEDURES . . . 52
H.2.2	NO ENTRIES			

PREVIEW OF THE NEXT SubSTEP

YOUR PRODUCT	*Plans for the creation of separate instructional tracks to accommodate sub-populations making up the total target population.*
WHAT YOU WILL WORK FROM	Characterization of the target population.
WHAT YOU WILL DO	(1) Identify characteristics of subpopulations: ... size ... relative homogeneity with respect to learning problems requiring accommodation (2) Identify groupings for which alternative tracks can be appropriately and effectively created.
FORMS YOU WILL USE	None

DESCRIPTION OF Sub-STEP	H.2.1



Job Aid Contents

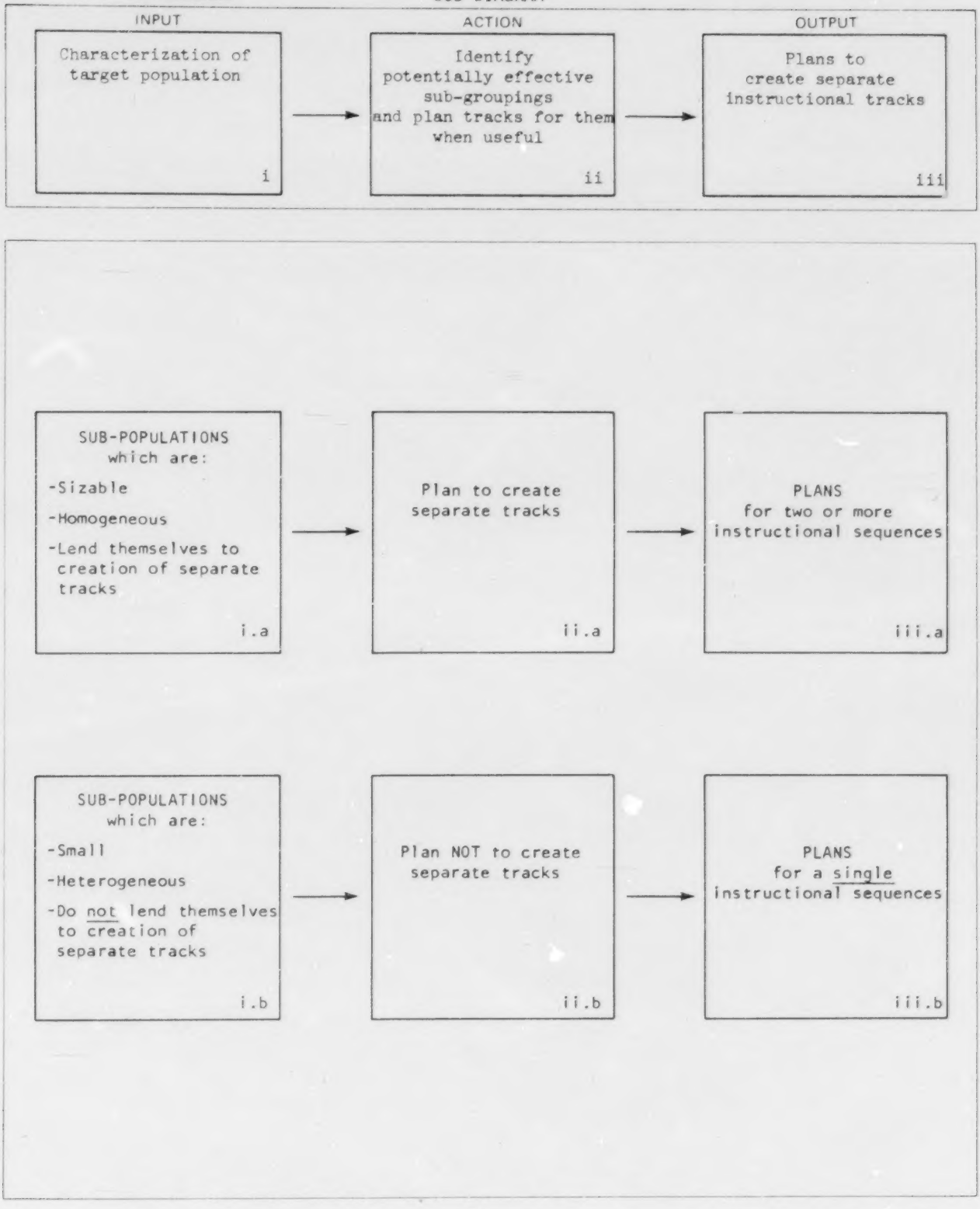
CRITERIA FOR IDENTIFYING INPUTS	ACTION TO BE TAKEN	STANDARD FOR OUTPUTS	FORMS TO USE
-MATRIX: Conditions favoring use of tracks . . . 48	-MATRIX: Types of tracks to consider 49	-MATRIX: Adequacy of plans for creating separate tracks 53	SUMMARY OF PROCEDURES . . . 52

Required Materials

COMPLETED MATERIALS	STEP	COMPLETED FORMS	STEP	BLANK FORMS
Characterization of target population (carried forward from)	H.1.2			

Sub- STEP H.2.1

JOB DIAGRAM



BACKGROUND INFORMATION

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Conditions favoring creation of tracks	48
Some groupings to consider and ways to accommodate them	49

H.2.1

IDENTIFICATION MATRIX

CONDITIONS FAVORING (NOT FAVORING) THE CREATION OF SEPARATE INSTRUCTIONAL TRACKS*

CONDITIONS	Conditions FAVORABLE for creating separate tracks	Conditions UNFAVORABLE for creating separate tracks
CRITERIA	-*SUB-POPULATIONS can be identified which meet all these conditions:* ••*All the members of a sub-population share the same type of problem (i.e., abilities, entry behavior)* ••*They are relatively alike in other respects (e.g., ability, interests, etc.)* ••*The sub-population is relatively large* *AND/OR* -*The PROBLEMS that need solving are amenable to "tracking" solutions which:* ••*Can be expected to work* ••*It makes economic sense to create*	-*SUB-POPULATIONS which share the same problems are:* ••*Relatively unlike with respect to other attributes (ability, interests)* ••*Relatively small* *AND/OR* -*The PROBLEMS that need solving are amenable to "tracking" solutions which:* ••*Cannot be expected to do an effective job* *OR* ••*Cannot be expected to be implemented economically*

*Creation of sub-groups is more likely to be done for a large pool of criterion behaviors (i.e., for a whole course) rather than for each criterion behavior; unless the criterion behavior, as defined, is very large in scope.

EXAMPLES	e.g., intelligence groupings	e.g., groupings based on knowledge of criterion behavior
	-*Relatively homogeneous groups, differing in general intelligence, can be reasonably and relatively economically accommodated by different tracks:* ••*Creation of variations that make the difference between tracks that can be done relatively simply and economically--by concentrating on systematic variations in one or two variables; e.g., number of examples, amount of repetition or review* -*Creation of high, medium, and low groups will result in tracks containing a relatively large number of students for each track*	-*The size of groups likely to have as much of the criterion behavior in their repertoire:* ••*Is not likely to be large enough to make economic sense* *OR* ••*Is not likely to be consistently of the same size from generation to generation (of students)*

H.2.1

DECISION MATRIX

SOME GROUPINGS TO CONSIDER AND TECHNIQUES FOR ACCOMMODATING THEM*

GROUPINGS	INTELLIGENCE GROUPINGS	GROUPS BASED ON ADAPTIVENESS OF THEIR SELF-ADOPTED PACE
ACTION TO TAKE	*For: Intelligence groupings* *-Systematically vary one or more of the following:* *··The size of unit to be practiced* *··The strength and type of prompts used* *··The speed with which prompts are faded* *··The type of practice provided (e.g., visual rather than verbal)*	*For: The TOO FAST (who, as a result, make errors)* *-Create fixed-pace presentations slowing them down* *-Deliver reinforcers for slower self-adopted pace at work (i.e., longer duration at work)* *For: The TOO SLOW (who are, as a result, inefficient)* *-Create a fixed-pace presentation speeding them up* *-Deliver reinforcers for faster self-adopted pace at work*

*As evidence becomes available about the stability and significance of other groupings and about methods for accommodating them, additional approaches should be considered.

JOB PROCEDURES

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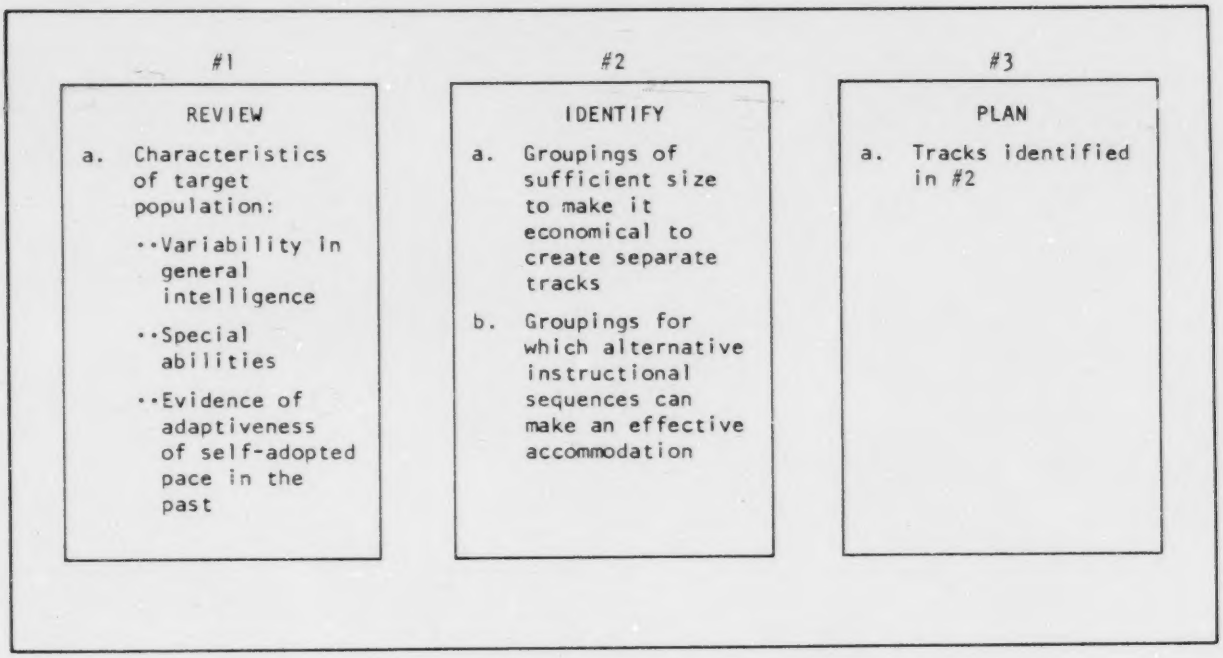
SUMMARY OF PROCEDURES	52
Adequacy of plans for accommodating SUB-POPULATIONS	53

H.2.1 ILLUSTRATION SUMMARIZING PROCEDURES INVOLVED IN PLANNING THE PREPARATION OF ALTERNATIVE TRACKS FOR ACCOMMODATING SUB-POPULATIONS


#1
REVIEW
a. Characteristics of target population:
··Variability in general intelligence
··Special abilities
··Evidence of adaptiveness of self-adopted pace in the past
#2
IDENTIFY
a. Groupings of sufficient size to make it economical to create separate tracks
b. Groupings for which alternative instructional sequences can make an effective accommodation
#3
PLAN
a. Tracks identified in #2

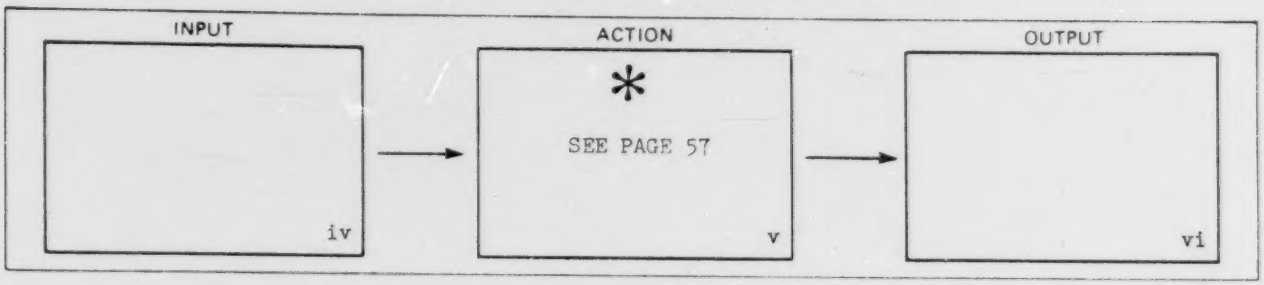
H.2.1

STANDARDS MATRIX

CRITERIA FOR ASSESSING ADEQUACY OF PLANS TO ACCOMMODATE SUB-POPULATIONS

OUTPUT PROPERTIES	COMPLETENESS	EFFECTIVENESS	EFFICIENCY
CRITERIA	-*All variables likely to affect learning of criterion behavior are considered when reviewing characterization of target population*	-*Tracks considered are based on population variables likely to make a difference with respect to learning of criterion behaviors* -*Sub-populations are relatively homogeneous with respect to relevant variables* -*Instructional sequences created are likely to do the job of accommodating differences* ··*i.e., likely to lead to fewer errors than on a single track* ··*Students are required to do only as much or as little as required to attain standards*	-*SUB-POPULATIONS are of sufficient size to make the outlay required to produce separate tracks economical* -*Similar SUB-POPULATIONS can be expected in future generations of classes* -*Tracks can be created relatively simply by systematic variation of a few variables*

DESCRIPTION OF Sub-STEP	H.2.2



Job Aid Contents

CRITERIA FOR IDENTIFYING INPUTS	ACTION TO BE TAKEN	STANDARD FOR OUTPUTS	FORMS TO USE

Required Materials

COMPLETED MATERIALS	STEP	COMPLETED FORMS	STEP	BLANK FORMS

*

NO DETAIL IS PROVIDED
FOR THIS SUB-STEP

(1) Student determination of what he will study, or how he will study, or when he is finished, or of what the standards ought to be is more likely to occur for entire courses or entire curriculum. It is not likely to occur for individual criterion behaviors.

TASKS D through J are performed (consecutively) only for each criterion behavior; then for the criterion behavior that follows it, and so on. Since the procedures in this HANDBOOK are designed to facilitate the development of instruction geared to individual criterion behaviors (and not to entire courses), no detail is provided on this issue.

(2) Additionaily, there is insufficient evidence on which to base the development of procedures to implement a student-determined curriculum.

STEP H.2

COMPLETION CHECKLIST

	IDENTIFIED	PERFORMED	PRODUCED	FORMS COMPLETED
H.2.1		Made plans to (not to) create separate tracks		
H.2.2		NO ENTRIES		